

## COHEN, DIPPELL AND EVERIST, P.C.

TABLE IV

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PART 90 SERVICES  
 LOCATED AT SITE PROPOSED  
 BY FOUR JACKS BROADCASTING, INC.  
 N 39-17-13 W 76-45-16

CALLSIGN	RADIO_SRVS	FREQUENCY	LIC_NAME	LAT-DEG	LAT-MIN	LAT-SEC	LON-DEG	LON-MIN	LON_SEC
STREET ADDRESS			CITY	ST	ZIP	ATTENTION	PHONE		
PWR-OUT	ERP	GND-ELE	ANT-HGT	HAAT					
WNKM913	YS	937.2750	HARFORD SMR INC	39	17	13	76	45	16
814 HOLLY DR E			ANNAPOLIS	MD	214010000		3019740975		
150.00000	350.00000	540	550	772	FB2C				
WNKM913	YS	937.2875	HARFORD SMR INC	39	17	13	76	45	16
814 HOLLY DR E			ANNAPOLIS	MD	214010000		3019740975		
150.00000	350.00000	540	550	772	FB2C				
WNKM913	YS	937.3000	HARFORD SMR INC	39	17	13	76	45	16
814 HOLLY DR E			ANNAPOLIS	MD	214010000		3019740975		
150.00000	350.00000	540	550	772	FB2C				
WNKM913	YS	937.3125	HARFORD SMR INC	39	17	13	76	45	16
814 HOLLY DR E			ANNAPOLIS	MD	214010000		3019740975		
150.00000	350.00000	540	550	772	FB2C				
WNKM913	YS	937.3250	HARFORD SMR INC	39	17	13	76	45	16

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PART 90 SERVICES  
LOCATED AT SITE PROPOSED  
BY FOUR JACKS BROADCASTING, INC.  
N 39-17-13 W 76-45-16

CALLSIGN	RADIO_SRVS	FREQUENCY	LIC_NAME		LAT-DEG	LAT-MIN	LAT-SEC	LON-DEG	LON-MIN	LON_SEC
STREET ADDRESS			CITY	ST ZIP	ATTENTION			PHONE		
PWR-OUT	ERP	GND-ELE ANT-HGT	HAAT							
WNKM913	YS	937.3625	HARFORD SMR INC		39	17	13	76	45	16
814 HOLLY DR E			ANNAPOLIS	MD 214010000				3019740975		
150.00000	350.00000	540 550	772 FB2C							
WNKM913	YS	937.3750	HARFORD SMR INC		39	17	13	76	45	16
814 HOLLY DR E			ANNAPOLIS	MD 214010000				3019740975		
150.00000	350.00000	540 550	772 FB2C							
WNXM924	IB	929.1125	HARTER, R PHILIP:EASTON, A T:EASTON, S D		39	17	13	76	45	16
1312 ACADEMY CT			BELMONT	CA 940020000 R PHILIP HARTER				4153497800		
300.00000	600.00000	540 550	774 FB							
KYC489	IB	496.1625	I & R EQUIPMENT CORPORATION		39	17	13	76	45	16
5681 MAIN ST			ELKRIDGE	MD 212270000				3017963200		
110.00000	106.00000	540 550	772 FB4							
KNR529	IB	495.9375	L AND L SUPPLY CORPORATION		39	17	13	76	45	16
1404 FRONT AVE			LUTHERVILLE	MD 21093				3018257800		
75.00000	375.00000	540 550	772 FB4							
KNR529	IB	498.9375	L AND L SUPPLY CORPORATION		39	17	13	76	45	16
1404 FRONT AVE			LUTHERVILLE	MD 21093				3018257800		
59.00000	148.00000	540 550	772 MO							
KAS454	LV	452.6250	MARYLAND, STATE OF		39	17	13	76	45	16
BALTIMORE WASHINGTON INTL ARPRT			BALTIMORE	MD 21240	STATE AVIATION ADMINISTRATION			3018597018		
50.00000	0.00000	540 550	0 FB							

## COHEN, DIPPELL AND EVERIST, P.C.

TABLE IV

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PART 90 SERVICES  
 LOCATED AT SITE PROPOSED  
 BY FOUR JACKS BROADCASTING, INC.  
 N 39-17-13 W 76-45-16

CALLSIGN	RADIO_SRVS	FREQUENCY	LIC_NAME	LAT-DEG	LAT-MIN	LAT-SEC	LON-DEG	LON-MIN	LON_SEC
STREET ADDRESS			CITY	ST	ZIP	ATTENTION			PHONE
PWR-OUT	ERP	GND-ELE ANT-HGT	HAAT						
WNHW417	GP	808.2625	MARYLAND, STATE OF	39	17	13	76	45	16
POB 8766			BWI AIRPORT	MD	212400000	STATE AVIATION ADMINISTRATION	3018597022		
10.00000	25.00000	540 550	762 MO						
WNHW417	GP	853.2625	MARYLAND, STATE OF	39	17	13	76	45	16
POB 8766			BWI AIRPORT	MD	212400000	STATE AVIATION ADMINISTRATION	3018597022		
90.00000	232.00000	540 550	762 FB2						
WNKI472	GO	853.6125	MESSENGER EXPRESS INC	39	17	13	76	45	16
806 15TH ST NW			WASHINGTON	DC	200050000		2023477333		
70.00000	355.00000	540 550	772 FB2						
WNJY741	GB	860.7875	MILLER, C J	39	17	13	76	45	16
3514 BASLER RD			HAMPSTEAD	MD	210740000		3012398006		
70.00000	75.00000	540 550	772 FB2						
WNLX972	GO	807.0625	OVERNITE TRANSPORTATION COMPANY	39	17	13	76	45	16
POB 1216			RICHMOND	VA	232090000		3017968550		
35.00000	51.00000	540 700	922 MO						
WNLX972	GO	852.0625	OVERNITE TRANSPORTATION COMPANY	39	17	13	76	45	16
POB 1216			RICHMOND	VA	232090000		3017968550		
75.00000	55.00000	540 700	922 FB2						
KNA585	IB	495.9375	SMITH REFRIGERATION INC	39	17	13	76	45	16
6600 HARFORD RD			BALTIMORE	MD	21214				
75.00000	375.00000	540 550	772 FB2						

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PART 90 SERVICES  
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N 39-17-13 W 76-45-16

CALLSIGN	RADIO_SRVS	FREQUENCY	LIC_NAME		LAT-DEG	LAT-MIN	LAT-SEC	LON-DEG	LON-MIN	LON_SEC
STREET ADDRESS			CITY	ST ZIP	ATTENTION			PHONE		
PWR-OUT	ERP	GND-ELE	ANT-HGT	HAAT						
KNJU848	GB	853.1375	WASHINGTON POST		39	17	13	76	45	16
1150 15TH ST NW			WASHINGTON	DC 200710000	JIMMY SPRINKLE			2023347707		
70.00000	250.00000	540	550	772	FB2					
KZU643	IB	498.9375	WESTINGHOUSE COMMUNICATION SERVICES INC		39	17	13	76	45	16
1025 CONNECTICUT AVE NW STE 506			WASHINGTON	DC 200360000	R C BENEDICT			3017654030		
50.00000	150.00000	540	550	772	MO					
KZU643	IB	495.9375	WESTINGHOUSE COMMUNICATION SERVICES INC		39	17	13	76	45	16
1025 CONNECTICUT AVE NW STE 506			WASHINGTON	DC 200360000	R C BENEDICT			3017654030		
50.00000	150.00000	540	550	772	MO					
KZU643	IB	495.9375	WESTINGHOUSE COMMUNICATION SERVICES INC		39	17	13	76	45	16
1025 CONNECTICUT AVE NW STE 506			WASHINGTON	DC 200360000	R C BENEDICT			3017654030		
75.00000	376.00000	540	550	772	FB2					

***Exhibit B***

VLISSIDES ENTERPRISES, INC.

County of Fairfax  
State of Virginia

Matthew J. Vlassides, being duly sworn upon his oath,  
deposes and states that:

He is a graduate Civil/Structural Engineer, a Registered Professional Engineer in the District of Columbia, State of Maryland, State of Virginia and forty four other States, and is the Owner of Vlassides Enterprises, Inc. specializing in tall tower design and construction, with offices at 7601 Burford Drive, McLean, VA 22102;

That his qualifications are a matter of record in the Communications Industry and in the Federal Communications Commission;

That the attached engineering reports were prepared by him or under his supervision and direction and

That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.

*Matthew Vlassides P.E.*

VLISSIDES ENTERPRISES, INC.

ENGINEERING STATEMENT

SCRIPPS HOWARD BROADCASTING COMPANY

---

This engineering statement has been prepared on behalf of Scripps Howard Broadcasting Company ("Scripps"), licensee of WMAR-TV, Channel 2, Baltimore, Maryland in support of its petition to deny the application filed by Four Jacks Broadcasting, Inc. ("FJB"), FCC File No. BPCT-910903KE. The FJB application seeks a construction permit for a new television station to serve Baltimore, Maryland on Channel 2 + (54-60 MHz) with an effected radiated power (ERP) of 100 kW (H&V) and 267 meters antenna height above average terrain. FJB proposes operation from an existing tower currently utilized by WPOC(FM) located at the geographic coordinates:

North Latitude: 39° 17' 13"

West Longitude: 76° 45' 16"

The FJB application should be returned since the tower, if used as proposed, is unsafe.

Tower Structure Suitability

Mr. Herman E. Hurst, Jr.'s statement in support of an opposition to a petition to deny an application for a new television broadcast station in Baltimore, Maryland FCC File No. BPCT-910903KE; And in particular in Page 2 under paragraph 2. Site Suitability Issue is incorrect. Mr. Hurst, a radio engineer who is not a Registered Professional Engineer under any engineering discipline, and who has no formal or even practical training and experience in Structural Analysis, Design, Fabrication and Construction of tall, medium or short Communications Towers attempts to make critical evaluations of my Technical Statement and Structural Computer Analysis for the Four Jacks Broadcasting, Inc. 666 ft. Guyed Tower. Mr. Hurst's assertions are uneducated, unprofessional, erroneous, and

inappropriate for the following reasons: All of my assumptions regarding the characteristics of the tower structural system are based on exhaustive study of the structure through personal observations with the use of high power binoculars, high power surveying instruments, large number of photographs taken from short distance with high power lenses, thirty years of experience in dealing with thousands of communications towers' design, analysis, fabrication, installation, inspection and overall construction. In making my assumptions concerning the characteristics of the tower structural system, I was very careful in giving the opposition every possible advantage, i.e.,

a) I assumed that all structural members on the tower (tower legs, horizontals and diagonals) are made of 50,000 psi high-strength steel, which is very questionable. It is more probable that the steel used for the tower legs is 35,000 psi ASTM A53 pipe and for the diagonals and horizontals ASTM A36 solid bars.

b) Examining the tower photographs presented in my tower analysis report, it is obvious that at the top of the tower is the skeleton of a ten bay FM antenna without radiating elements or with very small radiating elements. Because I was not very sure about the type of antenna I totally disregarded this significant antenna load and I did not include it in the tower analysis.

c) The geometry of the tower was carefully measured through surveying instruments and the panel height, type and diameter of the tower leg was verified during these optical measurements.

d) Mr. Hurst on Page 9 of his statement wrongly attests that twenty-three transmission lines were assumed to traverse the tower over the entire distance to each antenna. The truth is that twenty-two transmission lines total were used to feed the various indicated antennas, one conduit for the tower obstruc-



tion lights and the tower ladder. All transmission lines did not traverse the tower over the entire distance. Furthermore, in computing the wind load on the transmission lines, I assumed that eight transmission lines, the conduit and the tower ladder have 100% effective projected area to the wind; four transmission lines have 75% effective projected area to the wind; three transmission lines have 50% effective projected area to the wind; six transmission lines have 25% effective projected area to the wind; and the remaining one transmission line has 0% effective projected area to the wind; thus achieving certain transmission line bundling effect even though the actual transmission lines on the tower are not bundled (See Photographs).

e) Mr. Hurst virtually ends his critique by stating that my analysis fails to reflect the fact that lines are bundled into a single cylindrical vertical run up the tower. This is an outright misrepresentation of the existing condition and it is easy to see it by examining the pictures of the tower presented in my analysis report. In any case in paragraph (g) it is proven that bundling does not make the tower capable of accepting the Channel 2 antenna and even one 3-1/8 inch rigid transmission line.

f) Mr. Hurst states no information on transmission lines is included on the Land Surveyor's report. This is true. I picked up the antenna elevations and transmission lines from direct observations and photographs and I verified the antenna elevations by using the land surveyor's report.

g) Mr. Hurst states that Vlissides incorrectly assumes that the proposed Channel 2 antenna will require two 3-1/8 inch rigid transmission lines. I strongly believe that the assumption is correct and in accordance with good engineering practice. The only justification for Mr. Hurst to plan a low reliability antenna system is to squeeze costs and to support of FJB's

contention that the tower is safe. However, Mr. Hurst's effort to help the tower situation was destined to fail. Attached is a second revision of the tower analysis where the two 3-1/8 inch rigid transmission lines have been reduced to one 3-1/8 inch line. The balance of the twenty-one transmission lines have

Therefore, Mr. Hurst's plan to use one 3-1/8 inch rigid transmission line and to bundle all small lines in one impractical bundle did not help the tower situation as far as Four Jacks Broadcasting, Inc. is concerned. Still, 30% of the tower leg sections are overstressed from 0.1 to 67.7%. This coupled with the column buckling evaluation parameter for the tower (shown in my previous analysis) calculated at over 1.5 renders the subject tower unsafe for installing the Channel 2 antenna and one 3-1/8 inch transmission line.

h) In continuation of my policy of giving the opposition every possible break, I increased the allowable stress for all structural members of the tower by 33%. EIA/TIA Standard 222-E

<u>Antenna Design Parameters</u>			
<u>Height</u>	<u>Weight Including</u> <u>Base Support Frame</u>	<u>Shear</u>	<u>Overturning</u> <u>Moment</u>
104 ft.	17,000 lbs.	8900 lbs.	393,000 ft-lbs

k) On Page 6 of the Opposition to Petition to Deny Application the Four Jacks Broadcasting attorney takes a cheap shot against the disclaimer on my Analysis Report. This disclaimer is a standard clause required by the Insurance Company. I stand behind my statements and findings and this waiver of liability is a standard clause and does not detract from my findings.

l) The \$350,000.00 engineering estimate for the cost of building a new tower is not an inflated figure; rather, it is a conservative estimate.

m) Based on all the previous statements and the new Structural Computer Tower Analysis (Attached), it is my engineering opinion that, due to the large overstresses calculated in the tower legs, and the large colum buckling evaluation parameter (PHI), even though I gave every possible break to the tower, the subject tower is not adequately designed to support the Channel 2 antenna and its transmission line. Therefore, the subject tower must not be used for the installation of the Channel 2 antenna.

MATTHEW J. VLISSIDES, P.E.  
ENGINEERING CONSULTANT

Mr. Matthew J. Vlissides, an Engineering Consultant, has over 30 years of experience in structural and mechanical engineering and is a specialist in antenna and tower design, fabrication supervision and installation.

During the past twenty years he has performed extensive successful consulting work in the area of communications for L.T.V. Electrosystems, Inc., Comsat Corporation, Northrop-Page Communications Engineers, Inc., NASA Goddard Space Flight Center, ITT-SPC, COSMOS Engineers, Inc., Stainless, Inc., Bechtel Corporation, MCI, Microflex Company, Inc., R.F. Systems, Inc., Telcom, Inc., DCA, Coast Guard, Plessey, Ltd., Burleson Associates, Inc., E-Systems, Inc., RCA, Fairchild Space & Electronics, Inc., David L. Steel, Sr., P.E., Harris International, RCA Global, RMS, Sanders Associates, T-CAS, TELCOM, Teleconsult, Intelsat, numerous Broadcasting Stations throughout the USA, and others.

Prior to establishing his Engineering Business, Mr. Vlissides was chief structural engineer for Northrop-PAGE where he was responsible for the analysis, design, specification writing and fabrication supervision of advanced structures, such as self-supporting and guyed communication towers, antennas, tracking stations, radio telescopes and structures for the space communications program. He was instrumental in the development of the 42' antenna transportable commercial station operated by Comsat, and in the design of the wheel and track antenna and the integrated two-story building with antenna on top, utilized by LTV Aircraft Company.

Mr. Vlissides has participated in the successful engineering and implementation of several multimillion dollar projects, including the structural design and implementation of earth stations in Panama, Iran, Lebanon, Brazil, and the Comsat stations at Brewster, Andover and Paumalu. He was responsible for the structural/mechanical design of earth stations in Australia, Thailand and the Philippines, as well as West Coast tracking stations for the U.S. Navy.

In the intricate area of shock and vibration isolation and electronics equipment packaging in shelters, Mr. Vlissides has solved difficult problems for Page Communications Engineers at OGDEN Laboratories involving the MRC-113 U.S. Air Force Program.

Mr. Vlissides participated in the analysis, design and implementation of large microwave and troposcatter communications programs, including the multimillion dollar IWCS in

Vietnam, the Iranian Microwave (INTS), the NATO Bypass, and the Hongkong-Taiwan-Philippines tropo system. The major areas of involvement covered feasibility studies, advance survey details, civil-mechanical and electrical designs, and final implementation.

Mr. Vlassides was heavily involved in the design and construction of the VOA antenna and tower systems in VOA Kavala, Greece; Rhodes, Greece; and Liberia, Africa.

He has extensive experience in the design of structures using non-conventional materials as plastics, non-metallic filaments, glass filaments, etc.

In the area of multi-leveled guyed towers, Mr. Vlassides expanded a computer program able to handle guyed towers of up to 20 guy levels, and carrying concentrated loads and a top electronic umbrella with up to 36' long radials. The tower is treated as a beam-column on elastic supports with all secondary effects taken into consideration. Recently, Mr. Vlassides has developed a computerized design of a family of self-supporting and guyed microwave towers, covering a range of heights from 20-foot stub antenna mounts to 500-foot applicable and very economical for large communication projects.

Mr. Vlassides, In addition, has extensive experience in building structural analysis and design, such as highrise office and apartment buildings, hospitals, churches, communications buildings, etc.

Earlier, Mr. Vlassides was employed as a Structural Engineer by the U.S. Navy Department, Bureau of Yards and Docks, where he was responsible for the development of BUDOCKS criteria and standards and the design of structures for antennas and other communication facilities, and was heavily involved in the Nord Antenna and West Pac Australia Antenna Projects. In a previous position with the District of Columbia Highway Department, Bridge Division, he was field engineer for the D.C. approaches of the Theodore Roosevelt Bridge. Prior to this, he was involved in the engineering, administration, design and construction supervision of Public Works for the Greek Government.

Mr. Vlassides' professional affiliations include:

Association of Federal Communications Consulting Engineers

American Society of Civil Engineers, Fellow

National Society of Professional Engineers

American Concrete Institute

Professional Engineer - District of Columbia - #5949

Professional Engineer - New York - #044849

Professional Engineer - Maine - #2639

Professional Engineer - Maryland - #7868

Professional Engineer - Virginia - #05782  
 Professional Engineer - Pennsylvania - #20621.E  
 Professional Engineer - Illinois - #62-32261  
 Professional Engineer - New Jersey - #12618  
 Professional Engineer - Kentucky - #11506  
 Professional Engineer - Alabama - #15408  
 Professional Engineer - Arizona - #19057  
 Professional Engineer - Arkansas - #6273  
 Professional Engineer - Colorado - #23862  
 Professional Engineer - Connecticut - #14015  
 Professional Engineer - Delaware - #6957  
 Professional Engineer - Florida - #0036341  
 Professional Engineer - Georgia - #15453  
 Professional Engineer - Idaho - #5272  
 Professional Engineer - Indiana - #ENE8600628  
 Professional Engineer - Iowa - #10765 (Retired)  
 Professional Engineer - Kansas - #10337  
 Professional Engineer - Massachusetts - #32444  
 Professional Engineer - Michigan - #31880  
 Professional Engineer - Minnesota - #17485  
 Professional Engineer - Mississippi - #9591  
 Professional Engineer - Missouri - #E-21442  
 Professional Engineer - Nebraska - #E-6055  
 Professional Engineer - Nevada - #7162  
 Professional Engineer - New Hampshire - #6347  
 Professional Engineer - Wyoming - #5096  
 Professional Engineer - Ohio - #E-49967  
 Professional Engineer - Oregon - #13,133  
 Professional Engineer - Rhode Island - #4832  
 Professional Engineer - South Carolina - #10437  
 Professional Engineer - Utah - #7425  
 Professional Engineer - Vermont - #5193  
 Professional Engineer - Wisconsin - #E-24060  
 Professional Engineer - New Mexico - #9598  
 Professional Engineer - Louisiana - #22119  
 Professional Engineer - North Carolina - #12902  
 Professional Engineer - South Dakota - #4222  
 Professional Engineer - Montana - #ENG08785  
 Professional Engineer - North Dakota - #PE-3023  
 Professional Engineer - Washington - #23117  
 Professional Engineer - Oklahoma - #14540  
 Professional Engineer - West Virginia - #9901  
 Professional Engineer - Tennessee - #17,990  
 Professional Engineer - California - #C 040249  
 Professional Engineer - Texas - #59573

Certificate of Qualification by the National Engineering  
 Examiners, No. 4003.

Tau Beta Pi Honorary Engineering Society  
 Certified Fallout Analyst and Protective Construction  
 Analyst, DOD - 2TT0318865

Electronics Industries, Association, TR-34.2 Subcommittee  
 on Earth Station Antennas. TR 14.7 Tower Committee on  
 Communication Towers

Mr. Vlissides' major recent studies and prototype designs include:

Large Tracking Antenna Tower & Foundation Analysis & Design Consideration (July 1968)

Large Tracking Antenna Building & Foundation Earthquake Analysis & Design Considerations (July 1968)

Application of Fiberglass/Plastic to transportable communications systems.

High-gain Antennas Surface Geometry Determination (January 1968)

Optimum Antenna Design for Synchronous Communications Satellites (January 1970)

Original Design of 32-foot Transportable or Fixed Tracking Antennas (April 1971)

Participation in the preparation of Earth Station Antenna Standards for the Electronics Industries Association (EIA) (1969-1971)

Effective low cost methods for equipment shock and vibration isolation (June 1971)

Design of an experimental multibeam antenna system of satellite communications (1971-1972) Comsat Corporation

Analysis, Design & Fabrication Supervision of the Sectionalized Loran-C Transmitting Antenna for Cosmos Engineers, Inc. and the U.S. Coast Guard (1972-1973)

Tall guyed towers with provision of a broken guy condition and secure and easy access to the tower elevator landing directly from the transmitter building. Various applications at WBNS-TV, WJXT-TV, WBTB, WCBD, WXFL-TV and Hill Tower, Inc.

Mr. Vlissides has a B.S. Degree from the Athens, Greece Military Academy; B.C.E. and M.C.E. in Structural Mechanics from the Catholic University of America, where he has been a Doctoral Candidate in Structural Mechanics and Dynamics.

His language capabilities include English and Greek.



***Exhibit C***

COMPUTER STRUCTURAL ANALYSIS  
& ENGINEERING EVALUATION  
OF THE  
666 FT. GUYED TOWER  
CATONSVILLE, MARYLAND  
2ND REVISION  
FEBRUARY 1992

FOR  
SCRIPPS HOWARD BROADCASTING COMPANY

BY  
VLISSIDES ENTERPRISES, INC.  
7601 BURFORD DRIVE  
MCLEAN, VIRGINIA 22102  
(703) 356-9504

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2. PART II - COMPUTER INPUT DATA
3. PART III - COMPUTER ANALYSIS RESULTS

SECTION A

## INTRODUCTION

The subject structure is a 666 ft. guyed tower located in Catonsville, Maryland (Coordinates:  $39^{\circ} 17' 13''$ ;  $76^{\circ} 45' 16''$ ). The tower has a triangular cross-section with a face width of 4 ft. It is supported on a hinged base with seven guy levels of three guys each. The tower was designed and manufactured by Utility Tower Company in 1969.

The purpose of this analysis is to investigate the structural capability of the tower to support the Channel 2 TV antenna on top and its one 3-1/8" transmission line, in addition to the existing antennas and transmission lines.

The following assumptions have been made regarding the major characteristics of the structural system employed in the design of the subject tower:

- a) Section panels were assumed to be approximately 5 ft. in height.
- b) The tower span lengths were estimated to be 93.5 ft., 95.2 ft., 95.2 ft., 95.2 ft., 94.5 ft., 95.2 ft. and 94.4 ft. for Spans #1 through #7 respectively.
- c) The inner and outer guy anchors were estimated to be at 262 ft. and 402 ft. distances from the tower respectively.
- d) The guy cables are E.H.S. cables with estimated diameters of 5/8", 5/8", 3/4", 5/8", 3/4", 7/8" and 1" for guy levels #1 through #7 respectively.

e) The tower legs were assumed to be of 3.5" O.D. with 0.300" wall thickness in the bottom 500 ft. of the tower and 0.216" wall thickness from 500 ft. to top.

f) All the diagonal members were assumed to be solid rods of 5/8" diameter.

## PHOTOGRAPHS





